

5.0 REASONABLE ASSURANCE AND IMPLEMENTATION

EPA's regulations require that there is reasonable assurance that TMDLs can be implemented. Reasonable assurance indicates a high degree of confidence that the goals outlined in the TMDL, whether in the form of WLAs or LAs, can be achieved. In terms of the Christina River High-flow TMDL, various programs exist that can be utilized to help implement TMDLs.

For point sources, Federal regulations at 40 CFR 122.44(d)(1)(vii)(B), require effluent limitations for an NPDES permit to be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA. Furthermore, EPA has authority to object to issuance of a NPDES permit that is inconsistent with the WLAs established for that point source. Additionally, according to 40 CFR 130.7(d)(2), approved TMDL loadings shall be incorporated into the states' current water quality management plans. These plans are used to direct implementation and draw upon the water quality assessments to identify priority point and nonpoint source water quality problems, consider alternative solutions, and recommend control measures.

With regard to LAs for nonpoint sources, programs including Section 319 programs are available. Pennsylvania's Growing Greener funding has provided more than \$65 million dollars to environmental initiatives throughout the Commonwealth of Pennsylvania. Section 319 grant funding, supported by the Unified Watershed Assessment and the Watershed Restoration Action Strategies, is designed to focus resources towards the implementation of BMPs for nonpoint source pollutants.

Implementation of BMPs in the affected areas should achieve the loading reduction goals established in the TMDLs. Substantial reductions in the amount of bacteria and sediment reaching the streams can be made through the planning of riparian buffer zones, contour strips, cover crops, or stormwater retention techniques. These BMPs range in efficiency from 20% to 70% for sediment and bacteria reduction. Reductions in instream loads resulting from bank erosion can be made through two plans: (1) stream restoration plans that seek to stabilize stream banks and provide better transport of high storm flows associated with urban areas, and (2) implementation of urban BMPs that reduce peak storm flow through retention or increased infiltration. Such management practices will also address those stream segments listed as impaired due to water/flow variability. Further investigations should be performed in order to assess both the extent of existing BMPs, and to determine the most cost-effective and environmentally protective combination of BMPs required for meeting the bacteria and sediment reductions outlined in this report.

There are state and local policies and regulations in place to help ensure implementation of BMPs. At the state level, PADEP has developed a Proposed Comprehensive Stormwater Management Policy (Appendix A) that encourages implementation of BMPs for stormwater control to reduce pollutant loadings, recharge groundwater tables, enhance stream base flow during drought periods, and reduce the threat of stream bank erosion and flooding. This policy seeks to integrate watershed management plans with permitting programs. Therefore incorporation of TMDL targets at this stage is essential for setting goals for future watershed management plans. Such watershed management plans should be consistent with Stormwater Management Plans developed by counties and implemented by municipalities on a watershed basis, as required by the Pennsylvania Stormwater Management Act (Act 167).

At the Federal level, EPA's storm water permitting regulations require municipalities to obtain permit coverage for all storm water discharges from separate storm sewer systems (MS4s). Due to the variability of storm events and discharges from storm sewer system discharges, it is difficult to establish numeric limits on stormwater discharges that accurately address projected loadings. As a result, EPA regulations and guidance recommend expressing NPDES permit limits for MS4s as BMPs, and only using numeric limits in unique instances. Such BMP plans should accompany monitoring plans that test the performance of BMPs and provide a basis for revised management techniques. This iterative strategy is consistent with the watershed management approach discussed above, and allows an implementation plan where realistic goals can be set to improve the water quality of the streams through the use of BMPs throughout the watershed. The intention is to implement BMPs as required through the Federal and state policies and regulations described above with the ultimate goal of achieving the WLA. For more information, see the EPA memorandum titled *Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs* (November 22, 2002) in Appendix B.

For purposes of this TMDL, WLAs were developed for each municipality holding MS4 permits. Distribution of loads was estimated using land use data within municipal boundaries and application of unit area loadings (lbs/acre/year) determined for subbasins defined in the HSPF model and used for TMDL development. As additional data are collected by the States' storm water programs regarding drainage areas of each storm sewer system in the basin, these WLAs can be refined to more detailed representation of WLAs for each stormwater permit and LAs for areas not bound by such permits. To do this, the drainage area of each storm sewer should be delineated so that the area and distributions of land use can be determined. The land use areas within the stormwater drainage areas can be multiplied by the unit area loadings reported herein to determine the WLA for each MS4 permit and to calculate the load reduction necessary to meet the TMDL. The remaining load in each respective township can then be assigned to LAs. Until such storm water drainage area data are available, the WLAs and required load reductions reported herein are applicable.

The development of TMDLs is only the beginning of the process for stream restoration and watershed management. Load allocations to point and nonpoint sources serve as targets for improvement, but success is determined by the level of effort put forth in making sure that those goals are achieved. The load reductions proposed by the bacteria and sediment TMDLs require specific watershed management measures to ensure successful implementation.

For the Delaware portion of the Christina Basin, the Christina Basin Clean Water Partnership has developed a Watershed Restoration Action Strategy (WRAS), which is intended to provide a guideline for future watershed protection and restoration actions. The WRAS, developed in June 2003, is also designed to interconnect with EPA's earlier low-flow, point source TMDL for the Christina Basin and this high-flow, nonpoint source TMDL. The mission of the Christina Basin Clean Water Partnership is to "conduct a cooperative, interstate effort to restore the water quality of the streams and tributaries in the Brandywine, Red Clay and White Clay Creeks, and Christina River watersheds of Delaware, Maryland, and Pennsylvania to fishable, swimmable, and potable status by 2015." To do so, the Christina Basin WRAS identifies some goals and objectives that are related to this sediment and bacteria TMDL. One goal is to reduce bacteria loads in the streams to meet the Delaware swimmable primary recreation water quality standards of less than 100 cfu/100 mL. Another goal is to reduce

sediment loads from land and stream erosion sources to less than 250 pounds per acre per year. And, regarding stream habitat, the WRAS hopes to improve stream habitat to a “good” rating (above 81% for Habitat Community Index and 61% for Biological Community Index) in the Delaware portion of the Christina Basin.

There are many active watershed groups, in addition to various local and government organizations, that provide watershed stewardship in the Christina Basin. These include: the Brandywine Conservancy, Brandywine Valley Association, Red Clay Valley Association, Delaware Nature Society, White Clay Watershed Association, Stroud White Clay Creek Laboratory, and Christina Conservancy, and Wilmington River-City Steering Committee. Additionally, the Chester County Water Resources Authority and Chester County Conservation District in Pennsylvania, and the University of Delaware, Water Resources Authority, play an active role in coordinating watershed activities and initiatives for the Christina Basin. It is also important to mention that the Chester County and New Castle Conservation Districts have and hopefully will continue to install BMP implementation projects that are in line with the goals of the TMDL. Many of these organizations serve as local co-coordinators or as members of the Christina Basin Clean Water Partnership mentioned above.